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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Kazutaka Shibata, et al. Attorney Docket No.: ROHMP037

Application No.: 09/204,123 Examiner: R.K. Chang

Filed: December 2, 1998 Group: 3729

Title: METHOD OF SURFACE-MOUNTING ELECTRONIC COMPONENTS

CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the U.S. Postal Service with sufficient postage as first-class mail on April 15, 2004 in an envelope addressed to the Commissioner for Patents, Mail Stop Appeal Brief-Patents, P.O. Box 1450 Alexandria, VA 22313-1450.

Signed: Deborah L Neill

Deborah Neill

APPEAL BRIEF TRANSMITTAL
(37 CFR 192)

Mail Stop Appeal Brief-Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

This brief is in furtherance of the Notice of Appeal filed in this case on February 23, 2004. This brief is transmitted in triplicate.

This application is on behalf of

☐ Small Entity ☒ Large Entity

Pursuant to 37 CFR 1.17(f), the fee for filing the Appeal Brief is:

☐ $165.00 (Small Entity) ☒ $330.00 (Large Entity)

☐ Applicant(s) hereby petition for a _____ extension(s) of time to under 37 CFR 1.136.

If an additional extension of time is required, please consider this a petition therefor.

☐ An extension for months has already been secured and the fee paid therefor of $ is deducted from the total fee due for the total months of extension now requested.

☒ Applicant(s) believe that no Extension of Time is required; however, if it is determined that such an extension is required, Applicant(s) hereby petition that such an extension be granted and authorize the Commissioner to charge the required fees for an Extension of Time under 37 CFR 1.136 to Deposit Account No. 500388 (Order No. ROHMP037).

Total Fee Due:

Appeal Brief fee	$330
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☒ Charge any additional fees or credit any overpayment to Deposit Account No. 500388, (Order No. ROHMP037). Two copies of this transmittal are enclosed.

Respectfully submitted,
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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Signed: Deborah Neill

Deborah Neill

APPELLANTS' BRIEF PURSUANT TO 37 CFR 1.192

Sir:

This brief, transmitted herewith in triplicate, is in furtherance of the Notice of Appeal mailed in the above-referenced application on February 23, 2004. The fees required under 37 C.F.R. 1.17(f) and any other fees required for filing are enclosed.

This brief contains pursuant to 37 C.F.R. 1.192(c) the items under the following headings and in the order set forth below:

I Real Party in Interest
II Related Appeals and Interferences
III Status of Claims
IV Status of Amendments
V Summary of Invention
VI Issues
VII Grouping of Claims
VIII Arguments
IX Appendix of Claims Involved in the Appeal

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I. Real Party in Interest

The real party in interest of this application and of this appeal is:

ROHM Co., Ltd., which is a Japanese corporation doing business at 21 Saiin Mizosaki-cho, Ukyo-ku, Kyoto 615-8585, Japan and is the assignee in entire rights to this application.

II. Related Appeals and Interferences

There are no other appeals or interferences known to appellant, the appellant's legal representative, or assignee which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

III. Status of Claims

This application was filed with nine (9) claims of which two (2) were independent claims (claims 1 and 8).

In a response mailed August 10, 1999 to Requirement for Restriction dated July 23, 1999, Claims 3, 5, 8 and 9 were withdrawn as non-elected claims.

Claims 1, 2, 4, 6 and 7 were rejected in an office action dated October 27, 1999. In applicant's response mailed April 26, 2000, applicant presented remarks without amending any claims.

Claims 1, 2, 4, 6 and 7 were rejected in a final office action dated July 12, 2000. In applicant's response mailed December 13, 2000, applicant presented remarks without amending any claims.

In response to the advisory action dated December 28, 2000, applicant filed continued prosecution application on January 10, 2001 with preliminary amendment in which claim 1 was amended.

Claims 1, 2, 4, 6 and 7 were rejected in an office action dated February 22, 2001. In applicant's response mailed June 21, 2001, claim 1 was amended for the second time.

Claims 1, 2, 4, 6 and 7 were rejected in a final office action dated September 6, 2001. In response, applicant filed a request for continued examination on December 3, 2001 with preliminary amendment in which claim 1 was amended for the third time.

Claims 1, 2, 4, 6 and 7 were rejected in an office action dated January 15, 2002. In response, applicant filed an amendment on June 19, 2002 in which claim 1 was amended for the fourth time.

Claims 1, 2, 4, 6 and 7 were rejected in a final office action dated October 17, 2002. In response, applicant filed a request for continued examination on April 16, 2003 with preliminary amendment in which claim 1 was amended for the fifth time.

Claims 1, 2, 4, 6 and 7 were rejected in a final office action dated July 2, 2003. In applicant's response mailed October 1, 2003, applicant presented remarks without amending any claims.

In response to the advisory action dated October 16, 2003, applicant filed a request for continued examination on November 7, 2003 with preliminary amendment in which new claims 10-14, inclusive of one independent claim (claim 10), were added.

Claims 1, 2, 4, 6, 7 and 10-14 were rejected in a final office action dated December 24, 2003. In applicant's response mailed January 26, 2004, applicant presented remarks without amending any claims.

In an advisory action dated February 17, 2004, claims 1, 2, 4, 6, 7 and 10-14 were rejected. Notice of Appeal was mailed on February 23, 2004.

The status of the claims as set in said still another final action was and is as follows:

allowed claims --- none

claims objected to --- none

cancelled and withdrawn claims --- 3, 5, 8 and 9

claims rejected --- 1, 2, 4, 6, 7 and 10-14

IV. Status of Amendments

Claims 2, 4, 6, 7, 10-14 have not been amended.

The claims as set out in the Appendix are the claims as currently pending.

V. Summary of Invention

This invention relates to a method of surface-mounting electronic components (such as devices and elements D1, D2, etc.) of various sizes having conductive connecting members onto a target surface 10 such as a surface of a printed circuit board 1 by using an anisotropic conductive film 5. The target surface includes specified terminal-forming areas (such as 3a, 3b, etc.) each corresponding to a different one of the electronic components to be surface-mounted thereonto. Each of these terminal-forming areas includes at least one terminal part (such as 30a, 30b, etc.) and is no greater in area than the corresponding component to be surface-mounted thereonto. At least one of these specified terminal-forming areas has a plurality of terminal parts which are formed directly thereon and arranged position-wise such that any pair of them within the same terminal-forming area is closer than any pair in different ones of the terminal-forming areas. After the anisotropic conductive film 5 is placed to form a layer of an anisotropic conductive material on the

target surface so as to span a plurality of these terminal-forming areas, the electronic components are placed on this anisotropic conductive layer each at the corresponding one of the terminal-forming areas and pressed onto the anisotropic conductive layer such that they adhere to each other in an electrically conductive relationship.

VI. Issues

In aforementioned final office action dated December 24, 2003 (hereinafter simply "the Final Office Action"), the examiner rejected claims 1, 2, 4, 6, 7 and 10-14 under 35 U.S.C. 103 over Matsui in view of Tate. Regarding Matsui, the examiner correctly admitted that this reference fails to provide the following two supports, namely (1) the support for providing a plurality of terminal-forming areas being no greater than corresponding one of the electronic components; and (2) the support for providing a plurality of specified terminal-forming areas including a plurality of terminal parts directly thereon such that each pair of the terminal parts within any one of the terminal-forming areas is closer to each other than any pair of the terminal parts in different ones of the terminal-forming areas (lines 5-9 of page 3 of the Final Office Action). Regarding Tate, the examiner stated that this reference discloses providing these two supports which Matsui fails to provide (lines 10-16 of page 3 of the Final Office Action), considering Tate's numerals 36 as spanning a plurality of terminal-forming areas (paragraph 4 of the Final Office Action) although Tate describes numerals 36 as each indicating an adhesive mass preferably in a relatively viscous state (column 6, lines 9-10) applied at mutually separated spots (Fig. 2). The examiner then concluded that it would have been obvious to modify Matsui according to the teaching of Tate (line 17 of page 3 to line 2 of page 4 of the Final Office Action) although neither Matsui nor Tate discloses the step of forming one anisotropic conductive layer on the target surface so as to span the

plurality of terminal-forming areas, which step is one of the limiting conditions in independent claims 1 and 10.

ISSUE 1: IS IT PROPER TO REJECT A CLAIM AS BEING OBVIOUS OVER A FIRST REFERENCE IN VIEW OF A SECOND REFERENCE WHERE NEITHER THE FIRST REFERENCE NOR THE SECOND REFERENCE DISCLOSES ONE OF THE INVENTIVE ELEMENTS OF THE CLAIM OR EVEN HINTS AT ANY ADVANTAGE TO BE GAINED BY INCORPORTING THIS INVENTIVE ELEMENT?

VII. Grouping of Claims

It is Applicant's intention that all claims 1, 2, 4, 6, 7 and 10-14 stand or fall together, as far as the reasons of rejection stated in the Final Office Action are concerned.

VIII. Arguments

ISSUE 1: IS IT PROPER TO REJECT A CLAIM AS BEING OBVIOUS OVER A FIRST REFERENCE IN VIEW OF A SECOND REFERENCE WHERE NEITHER THE FIRST REFERENCE NOR THE SECOND REFERENCE DISCLOSES ONE OF THE INVENTIVE ELEMENTS OF THE CLAIM OR EVEN HINTS AT ANY ADVANTAGE TO BE GAINED BY INCORPORTING THIS INVENTIVE ELEMENT?

A claim may be rejected under 35 U.S.C. 103 as being obvious over a first reference in view of a second reference only if these two references satisfy certain conditions with respect to the claim. One of these conditions is that every inventive element characterizing the claim must be disclosed in or obvious in view of at least either one of the references. One of the inventive elements of independent claims 1 and 10 is the step of forming an

anisotropic conductive layer on the target surface so as to span the plurality of terminal-forming areas (which areas themselves have limitations of their own imposed thereon) but this limitation, or anything comparable to this limitation, is nowhere to be found in or hinted at by either Matsui or Tate.

As admitted by the examiner, Matsui does not even consider providing a plurality of terminal-forming areas, and hence such idea of "forming an anisotropic conductive layer on the target surface so as to span the plurality of terminal-forming areas" has no room for entry into Matsui. Tate discloses providing a plurality of terminal-forming areas and even providing a body portion 29 of an electronic component 28 at each of these terminal-forming areas, but the combination of these two aspects of the references can produce only a plurality of Matsui-type arrangements, still failing to disclose any production step comparable to that of "forming an anisotropic conductive layer on the target surface so as to span the plurality of terminal-forming areas."

If Tate is compared with claim 1 or 10, one immediately notes that Tate does not disclose the kind of anisotropic conductive layer limiting the scope of claim 1 or 10. As explained above, the examiner seems to be saying that the adhesive mass 36 of Tate is comparable to the anisotropic conductive layer of claims 1 and 10, or at least replaceable by the kind of anisotropic conductive material disclosed by Matsui, but mere substitution of Tate's adhesive mass 36 (Fig. 2 and 12-15) by Matsui's anisotropic conductive material, no matter how this is to be accomplished, would not result in any single anisotropic conductive layer on the target surface spanning two or more terminal-forming areas.

Tate's adhesive mass 36 in liquid form is injected (column 8, lines 46-59) into the individual open areas 13 so as to bring about the situation shown in Fig. 12 from that shown

in Fig. 11. In other words, if Tate's adhesive mass were to be substituted by Matsui's anisotropic conductive material, as the examiner seems to be suggesting, Matsui's material would have to be deposited individually into the open areas 13 of Tate. Fig. 2 of Tate shows, however, a plurality of adhesive masses 36 scattered around over various terminal-forming areas. According to the examiner, each of these masses 36 will have to be replaced by Matsui's anisotropic conductive layer and the result of such replacement according to the examiner would be a structure having as many anisotropic conductive layers of Matsui's type as there are Tate's adhesive masses 36 found in Fig. 2 of Tate scattered over a plurality of terminal-forming areas. Indeed, Fig. 2 of Tate shows eight of such adhesive masses 36, and Fig. 3 shows five components 27, 26, 25, 24 and 28 covering seven of these adhesive masses (the top one of the adhesive masses 36 remaining uncovered). Since each of these five components may be considered to be occupying a separate one of terminal-forming areas and the unoccupied adhesive mass 36 at the top may be regarded as corresponding to still another terminal-forming area, there are altogether six terminal-forming areas defined in the example shown by Fig. 3 of Tate. In other words, as many as eight of Matsui's anisotropic conductive layers (each replacing one of Tate's adhesive masses 36 according to the examiner) will be found spanning six terminal-forming areas defined by Tate, but this is fundamentally different from, and cannot be described as, a single anisotropic conductive layer formed on the target surface to span a plurality of terminal-forming areas that is required in claims 1 and 10.

It is one of the important inventive elements of claims 1 and 10 to provide such a single anisotropic conductive layer spanning a plurality of terminal-forming areas for effectively surface-mount a plurality of electronic components. Applicant believes not only

that this has not been done before but also that it was not obvious to try. The examiner must have been in agreement on this point because the examiner elected not to rely on the "obvious-to-try" argument in rejecting the claims, and applicant is in full agreement with the examiner on this point.

CONCLUSION

ISSUE 1 indicates that the Examiner incorrectly rejected the claims under 35 U.S.C. 103. Rejection of claims 1, 2, 4, 6, 7 and 10-14 should be reversed.

Respectfully submitted,

Dated: _____

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Atty. Docket: ROHM P037

IX. Appendix of Claims Involved in the Appeal

1. A method of surface-mounting a plurality of electronic components having conductive connecting members, said method comprising the steps of:

providing a target surface having a plurality of specified terminal-forming areas thereon, each of said specified terminal-forming areas being no greater than corresponding one of said electronic components and including at least one terminal part therein, at least one of said terminal-forming areas including a plurality of terminal parts directly thereon such that each pair of said terminal parts within any one of said terminal-forming areas is closer to each other than any pair of said terminal parts in different ones of said terminal-forming areas;

forming an anisotropic conductive layer on said target surface so as to span said plurality of terminal-forming areas;

placing said plurality of electronic components on said anisotropic conductive layer individually above said plurality of terminal-forming areas; and

pressing said plurality of electronic components to said anisotropic conductive layer so as to thereby cause said conductive connecting members of said plurality of electronic components to individually become adhered to and in electrically conductive relationship with a corresponding one of said terminal parts through said anisotropic conductive layer.

2. The method of claim 1 wherein said anisotropic conductive layer is formed by attaching a single sheet of anisotropic conductive film to said target surface, said anisotropic conductive film containing conductive particles dispersed inside a thermosetting synthetic resin.

4. The method of claim 2 wherein said anisotropic conductive layer is heated as said plurality of electronic components are pressed to said anisotropic conductive layer.

6. The method of claim 2 further comprising the step of preparing said single sheet of anisotropic conductive film in a shape according to positions and shapes of said terminal-forming areas of said target surface.

7. The method of claim 4 further comprising the step of preparing said single sheet of anisotropic conductive film in a shape according to positions and shapes of said terminal-forming areas of said target surface.

10. A method of surface-mounting a plurality of electronic components having conductive connecting members, said method comprising the steps of:

providing a target surface having a plurality of specified terminal-forming areas thereon, each of said specified terminal-forming areas being no greater than corresponding one of said electronic components and including at least one terminal part therein, at least one of said terminal-forming areas including a plurality of terminal parts directly thereon such that each pair of said terminal parts within any one of said terminal-forming areas is closer to each other than any pair of said terminal parts in different ones of said terminal-forming areas, wherein the terminal parts are distributed in a non-uniform manner depending on the sizes of said terminal-forming areas;

forming an anisotropic conductive layer on said target surface so as to span said plurality of terminal-forming areas;

placing said plurality of electronic components on said anisotropic conductive layer individually above said plurality of terminal-forming areas; and

pressing said plurality of electronic components to said anisotropic conductive layer so as to thereby cause said conductive connecting members of said plurality of electronic components to individually become adhered to and in electrically conductive relationship with a corresponding one of said terminal parts through said anisotropic conductive layer.

11. The method of claim 10 wherein said anisotropic conductive layer is formed by attaching a single sheet of anisotropic conductive film to said target surface, said anisotropic conductive film containing conductive particles dispersed inside a thermosetting synthetic resin.

12. The method of claim 11 wherein said anisotropic conductive layer is heated as said plurality of electronic components are pressed to said anisotropic conductive layer.

13. The method of claim 11 further comprising the step of preparing said single sheet of anisotropic conductive film in a shape according to positions and shapes of said terminal-forming areas of said target surface.

14. The method of claim 12 further comprising the step of preparing said single sheet of anisotropic conductive film in a shape according to positions and shapes of said terminal-forming areas of said target surface.